The Effect of the Mastery Learning Model on Learning Outcomes and Collaboration Skills Elementary School Students

Roni Wahyu Wandani[1]✉, Sutisna Permana[2] , Wisnu Zakaria[3] , Wahyu Sopandi[4]
[1,2,3,4] Program Studi Pendidikan Dasar, Sekolah Pascasarjana, Universitas Pendidikan Indonesia, Bandung, Indonesia
✉ roniwahyuwandani@student.upi.edu

Abstract. This study examines the effect of using mastery learning models on learning outcomes and collaboration skills of fifth-grade elementary school students. This quantitative study used the pre-experimental method with a one-group pretest-posttest design. This research involved 11 elementary school students from a school in Subang Regency. The research data were obtained using instruments in the form of multiple choice test sheets and descriptions given before and after treatment and collaboration skills observation sheets. Data analysis used descriptive statistics and inferential statistics, namely the normality test, homogeneity test and hypothesis testing paired sample t-test. From the research results, it is known that the t-test tcount is 21.133 > ttable 1.812. From these results, it can be seen that applying the mastery learning model has a significant influence on student learning outcomes. Acquisition of student collaboration skills obtained, starting from the criteria of being entirely collaborative to very collaborative. Then the use of mastery learning models affects student learning outcomes and student collaboration skills.

Keywords: Mastery Learning Model, Learning Outcomes Students, Skills Collaboration, Elementary School

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INTRODUCTION

Current education can be something crucial for human life and survival. People who have good education will compete as well as approaching direction change lead to more good again. Learning how to make an effort develops humans in more direction well, then successful education depends on the element of the human. The thing this required learning in the educational process because there an educator could with aware know your skill level participant educated on the material presented (Nursyamsi et al., 2020). Learning is also a must customized with needs study for reach destination education.

Frequent problems appear in environmental education; one of them is difficulty studying students. Learning difficulties can cause a decrease in learning outcomes obtained by students. The difficulties include interest in activities, low learning, learning ecosystems that do not support and students' cognitive abilities are lacking more than average (Rinaningsih et al., 2018). When learning difficulties are experienced, the participant's educate not handled by educators. The thing then, of course it will result in fewer student learning outcomes good even will not get specified minimum learning completeness (Nurazizah & Rinaningsih, 2021).

In responding to the learning difficulties faced by students, educators must design learning with a learning model of course capable bring students to reach ko completion learning in material science lessons displacement heat. The mastery learning model is one of the learning models that can overcome learning difficulties. The mastery learning model aims to determine how the method participant educated can achieve a level of completeness that an institutional unit has set. The characteristic complete learning model exists remedies that aim to deal with students' learning difficulties when studying something Thing or material (Rusmin, 2016). With this in mind, participants will want some degree of information dominance and capacity for a predetermined action. Participant students who have passed can proceed to the next learning unit. Then again, participants who still need to fulfill the principles of agreed learning rules must try hard to work on the material (Nurazizah & Rinaningsih, 2021).

The mastery learning model is a learning model that provides an understanding of draft theory more learning readily accepted by the participants educate (Lediana, 2017). Then, with

applied to increase results, study participants educate (Basri et al., 2017). If using the mastery learning model, participants who learn at first have a low cognitive could be improved becomes better again or arrive at the criteria completeness study at each institution learning (Block, 1971). Hence, briefing results learn more good through the mastery learning model will maintain an understanding of Theory in a manner no stay and show time as well as different conditions (Nurazizah & Rinaningsih, 2021). Meanwhile, the learning model applied will permanently maintain time as well as there is the possibility of understanding different materials (Özden, 2008). Conventional learning will impact the teacher's dominating role in the classroom, will result in students being inactive and the class atmosphere being monotone (Ghultom & Putra, 2016).

Some of the previous findings state that this model is very suitable to be applied in learning in elementary schools because this model requires students to understand the learning material thoroughly and provides remedial which has the aim of dealing with students' learning difficulties when studying a matter or material (Nurazizah & Rinaningsih, 2021; Rusmin, 2016). As for the process of complete understanding of the material, students are intentionally required to communicate, work together and be responsible in groups to achieve learning goals (Zairmi et al., 2019). This, makes one of the skills in the 21st-century skills, namely student collaboration needed in understanding the material and completing learning (Krisna Dewi & Parmiti, 2022).

Skills collaboration is the ability to participate in every activity to build a connection with others, each other value relationships, and work team to reach the same goal (Le et al., 2018; A. Rahmawati et al., 2019). One way to hone Skills collaboration student is using learning (Istiyono et al., 2014). Education develops ability and knowledge and is oriented to students' collaborative ability (Andayani et al., 2018). In Thing this, students capable reach Skills collaboration by destination learning, then tested with an application using mastery learning models.

Based on the background behind the research described above, the question compiled research is "How does the application of learning models mastery learning result in learning and skills collaboration among students?". As for goals study, this, i.e.," Knowing the influence of learning models mastery learning to results learning and skills collaboration students."

METHODE

Research Design

Type study studies quantitative with the method used that is, study experiment. Study experiments are marked with no existing group comparison and randomization. The research design used in a study is a pre-experiment from one group pretest-posttest design. Researcher use design one group pretest-posttest design. This research design means treating one group or more in the following conducted observation results in the data (Sugiyono, 2015).

Table 1. Model pre-experiment design form one group pretest-posttest design

Group	*Pretest*	Treatment	*Posttest*
experiment	O_1	X	O_2

Description :
X : Treatment (treatment)
O_1 : Test beginning *(pretest)*
O_2 **:** Test end *(posttest)*

At stage this, implementation learning using the mastery learning model. Whereas analyzed results are the results of study students in class V SD. In reviewing this, device research used for gathering information is a test. The test used is corner view knowledge used in the review. This form has many double choices with four options answers (a, b, c and d) as well description, with amount questions, with a total number of questions, i.e., 10 for choice doubles and 5 for description. Some techniques were used to obtain information instruments, more specifically: Test strategy used to determine fulfillment results study students and consequences of pretest and posttest students.

Population and Sample

The subject of study is student class V consisting of 11 students. Student men totaling five and students women amounted to 4 studies located in one of the elementary schools in Subang Regency, which is held in odd semesters year teaching 2021-2022.

Instrument Study

The research instrument used in a study is testing instruments and sheets evaluation Skills collaboration. Test instruments designed such shapes based on aspect cognitive level C3 to C4 on the material displacement heat. As for the test instrument grille, see the results study students made as following:

Table 2. Grid Instrument Learning Outcomes Test on Kompetensi Dasar (KD 3.6)

Lesson Content : IPA (Ilmu Pengetahuan Alam
Teaching Material : Perpindahan Kalor
Class / Semester : Fifth-grade / 1 Academic
Year : 2021-2022

Theory	Indicator Question	Cognitive Level	Number Question	Form Question
Fire as Source Energy Hot	With served text participants could identify characteristic features, source energy, hot	C3	1	Multiple Choice
	With the presented table, participants could differentiate source energy heat and benefits.	C4	2	Multiple Choice
	With the presented table, participants educate could analyze the difference in draft displacement heat	C4	3	Multiple Choice
Displacement heat Conduction, Convection, and Radiation	With served pictures, participants could analyze draft displacement heat in manner conduction.	C4	4	Multiple Choice
	With the presented table, participants educate could determine related events with convection	C3	5	Multiple Choice
	With served pictures, participants could analyze other related events with the transfer process heat in a convection manner.	C3	6	Multiple Choice
	With served text, participants could analyze draft displacement heat daily.	C4	7	Multiple Choice
	Participants could analyze draft displacement heat.	C4	8	Multiple Choice
	With served text, participants educate could determine the number of owned function fire	C3	9	Multiple Choice
	With served text, participants could analyze draft displacement heat daily.	C4	10	Multiple Choice

Theory	Indicator Question	Cognitive Level	Number Question	Form Question
	With served pictures, participants educate could analyze and decipher event displacement heat in a manner that radiation.	C4	11	Description
	With served text, participants could identify draft displacement hot in manner conduction and apply it daily.	C3	12	Description
	With served pictures, participants could analyze incident displacement heat in a manner convection in life daily.	C4	13	Description
	Participants could identify the source of fire and its benefits.	C3	14	Description
	Participant education could compare types of displacement heat as well as from facet the advantages and disadvantages.	C4	15	Description

Next is the second instrument, sheet evaluation collaboration students used for knowing level collaboration student During activity learning going on. Rating sheet this form accompanies the assessment with a rubric for evaluating the Skills of collaboration students. Rating sheet Skills collaboration uses a collection score with a Likert scale with conditions (4) Very Good, (3) Good, (2) Good Enough, (1) Not Good, and (0) Not good.

Table 3. Grid Indicator Skills Collaboration

Aspect	Indicator
Responsibility	Be responsible for the joint answer for tasks/jobs collaboratively.
	Complete Duty at the appropriate time.
flexibility	Adapt the same member group.
	Follow plot discussion and generate new ideas.
Work same	Every member groups each other involved and mutually complete based on the ability individual.
	Cooperate in a manner adequate for completing something problem.
Compromise	Deliberation intake decision.
	Accept criticism, suggestions, and *rewards*.
Communication	Communication in a manner effective in a group.
	Communication in a manner effective between the group.

Adaptation from (Pratiwi et al., 2020)

Data Analysis Techniques

After the data is collected, the analysis uses descriptive analysis. Validation data analysis was used to analyze each device's learning. Analysis results were made as a discussion beginning without making something conclusion research. Then the data is analyzed using the technique Analysis Inferential that is, through paired sample t-test with the use SPSS application for windows version 25. Next, gain test (increase) as indication enhancement results learning through the applied model with Gain category (increase) as following:

Table 4. N-Gain Criteria

N-Gain Criterion	
g > 0.7	Tall
0.3 ≤ g ≤ 0.7	Currently
g < 0.3	Low

The data analysis was carried out in processing assessment data Skills collaboration is descriptive statistical way results recap evaluation reference benchmark. The value obtained from results recap evaluation Skills collaboration student then the value obtained made category with category assessments following:

Table 5. Criteria Skills Collaboration Student

Score	Category
>3,6	Very Collaborative
3.1 – 3.5	Collaborative
2,1 – 3	Enough Collaborative
1,1 – 2	Less Collaborative
0 – 1	Not Collaborative

Adaptation from (Sufajar & Qosyim, 2022)

Grades of students who have been known from criteria such, then researcher next analyze Skills student collaboration.

RESULTS

Analysis Descriptive

1) Learning Outcomes

Based on the acquisition of research data collected with use sheet given test _ before and after treatment (treatment). Analysis of calculated data based on the difference between the average pretest and posttest with formula D = 02 – 01. Description results learning using the mastery learning model as follows:

Table 6. Statistics Results Study

Descriptive Statistics

	N Statistics	Range Statistics	Minimum Statistics	Maximum Statistics	Means Statistics	Means std. Error	std. Deviation Statistics
Pretest	11	33	76	43	60.18	11,453	131,164
Posttest	11	70	100	30	83.36	10,443	109055
Valid N (listwise)	22						

Table 6 shows 11 students participating in the pretest. In the pretest results, the minimum score is 33, and the maximum score is 76. The distance between the smallest and largest scores in the pretest is 43, with an average score of 60.18. In the final test (posttest) that was carried out, the results of students who took the posttest were as many as 11. The posttest results were that the minimum value was 70, and the maximum tscore was 100. The distance between the smallest and largest values in the pretest was 30, with an average score of 83.36.

In this case, it can be seen that there is an increase in learning outcomes on tests carried out before and after using the mastery learning model. The following is a visualization of the increase in pretest results in the posttest in the graph below

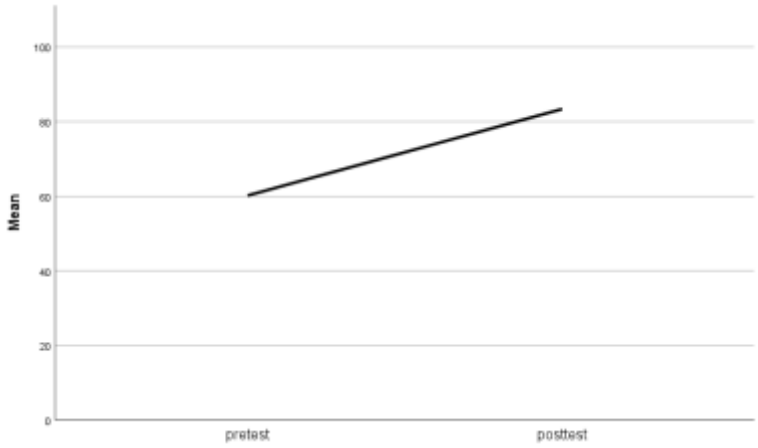

Figure 1. Improved pretest *and* posttest *results*

1) Skills Collaboration Student

Based on the acquisition of research data obtained using peer assessment on skills collaboration students who performed at the time activity learning going on. Following this is the score final peer assessment result data in the study Skills collaboration student.

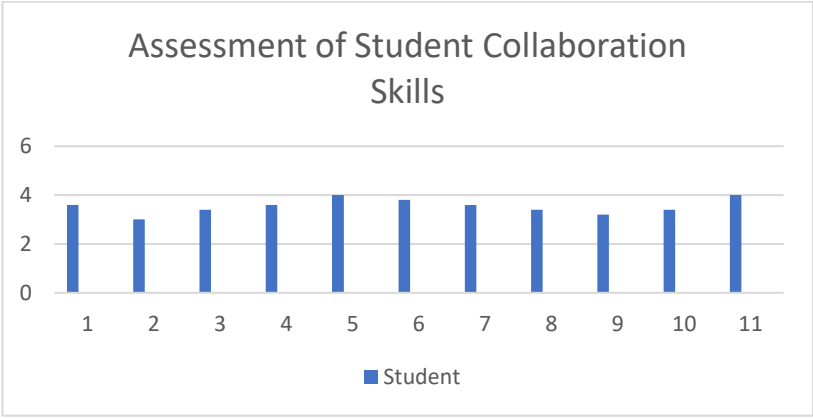

Figure 2. Acquired Value of Student Collaboration Skills

Figure 2. Above obtained results evaluated Skills collaboration; students ranged from values 3 – 4, with score the most, namely 3.4 and 3.6, namely description of Collaborative and Highly Collaborative

Analysis Inferential

Analysis statistics is inferential on the part for the testing hypothesis that has formulated and before to do inferential statistical analysis, especially formerly prerequisite test.

1) Prerequisite Test

Using the normality test, results analysis score results learn science students stated in table 4 below.

Table 7. Normality Test Table

	Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Statistics	Df	Sig.	Statistics	df	Sig.
learning outcomes	.199	20	.037	.916	20	082

a. Lilliefors Significance Correction

Based on table 7 results analysis of student learning outcomes scores based on the amount of sample under 50 people then used column Shapiro-Wilk for comparison (Raharjo, 2019). The normality test table shows that the value of Sig. in the Shapiro-Wilk column or P value > α, which is 0.082 > 0.05. This shows that the value of students' science learning outcomes in learning outcomes is in the normal category.

2) Effectiveness of the Learning Model

Effectiveness implementation of the mastery learning model to results study Among before and after analyzed implementation using the *paired sample test* t-test. The results of this test used for knowing significance results enhancement as following:

Table 8. Paired Sample Test Table

	Paired Differences					t	df	Sig. (2-tailed)
	Means	std. Deviation	std. Error Means	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 score - ML	70,273	15,597	3,325	63,358	77,188	21.133	21	.000

Testing the significance of the effectiveness of the imimplementing the mastery learning learning model in this study was conducted the Two Related Sample Test technique with the help of SPSS version 25. The results of the t test showed a score of 21,133 (sig = 0.000) which means the value of sig (0.000) < α (0.05)). So the results of this test reject Ho and accept Hi. So it can be concluded that the results of the t-test analysis describe the implementation of the mastery learning model significantly and very effectively.

3) Improved Learning Outcomes Student

For see an increase in yield study through the mastery learning learning model. So conducted data analysis with n-Gain test (increase) results study student with already category determined as in the table following:

Table 9. N-Gain Test

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S-11
Pretest	60	59	53	56	66	70	76	70	56	63	33
Posttest	83	70	86	73	96	83	96	100	70	80	80
N-Gains	0.58	0.27	0.70	0.39	0.88	0.43	0.83	1.00	0.32	0.46	0.70
Information	Enough	Low	Tall	Enough	Tall	Enough	Tall	Tall	Enough	Enough	Tall

Table 2 below. So students who fall into the high category (value > 0.7), i.e., there are five students. Next, students in the excellent category (value 0.3> g> 0.7), namely, there are five students. Then students enter the category low (value <0.3). There is one student. From these three categories of student abilities, if determined the average gain value (increase) throughout the student so average is obtained, i.e., 0.60, which means enhancement results study students in the mastery learning model, namely in the category enough.

DISCUSSION

Learning Outcomes

Judging from the results of the testing and testing of the theory that has been carried out, it shows that an understanding of the use of the mastery learning model affects the learning outcomes of the intellectual part of learning heat motion in fifth-grade elementary school students in Subang Regency. This can be seen from the learning outcomes of the pretest and posttest from an intellectual perspective which shows that the learning outcomes of the posttest are better than the pretest learning outcomes by examining the range (distance), which is worth 23.18. This is by research (Nurazizah & Rinaningsih, 2021), with the mastery learning model influencing student learning outcomes in chemistry learning with an effect size of 1.32, which shows that the mastery learning model has a significant effect.

Furthermore, based on the results of inferential data analysis through the paired sample t-test, the mastery learning model significantly influences learning the heat transfer material for class V elementary school. This is in line with research (Arusman, 2019) with the acquisition of fcount>ftable, namely 2.90>2.72 for a significant level of 95% and α = 0.05. The study results show that the Ha hypothesis is accepted, which means that the mastery learning approach with the remedial group pattern influences student learning outcomes.

Furthermore, the discussion through inferential analysis of the Gain test (increase) on research data shows that students who use the learning model experience an increase in learning outcomes that is equal to 0.60, which is in the "enough" category to increase. This result is in line with (Y. Rahmawati, 2013). The follow-up impact of this review is an increase in student learning outcomes. These results must be seen from the level of learning achievement of students who get average scores, experiencing an increase from each cycle. The end of this review is that mastering domination learning strategies can further develop learning outcomes in basic science subjects.

Skills Collaboration

Based on the assessment sheet that has been done, the average student has reached the collaborative and very collaborative stage. There is only one that has enough collaborative value. This shows that the mastery learning model influences student collaboration skills. This is supported by the opinion (Dhelilik, 2022) that the mastery learning model concerning the 2013 curriculum, namely the mastery learning model, can present knowledge and skills for students, which can be obtained in various ways, one of which is from collaboration skills.

CONCLUSION

Based on the results of the tests that have been carried out, it tends to be concluded that (1) the implementation of the learning model experienced a significant increase through the results of the average score from the pretest and posttest. The completeness of the learning outcomes of class V SD students on transfer material heat with an average pretest value of 60.18 and 83.36 posttest. (2) Based on descriptive testing, implementing learning by utilizing the mastery learning model further to develop the learning outcomes of transfer material calories can be feasible. (3) through the Gain test, the effect of the learning model is significant on the learning outcomes of transfer material heat has increased with an increased value of 0.60, which is in the good category. Given the final results of the review, researchers provide suggestions, especially the implementation of learning models that should be possible on different materials and can be added other variables as supporting factors for additional exploration that can be made. (4) Through the application of the mastery learning model can influence Skills collaboration among students with criteria starting from enough collaboration so very collaborative.

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